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# BREAKAWAY AC/DC ADAPTER

HP INC

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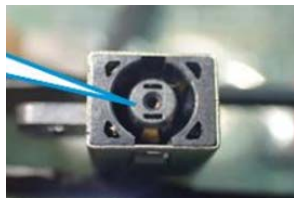


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## Breakaway AC/DC Adapter

In a PC the process of power delivery starts with the AC adapter and DC jack interconnect. The adapter is plugged into a DC jack to supply power to the PC. A DC jack typically includes a center barrel made of plastic, which helps separate the power and ground contacts to help to prevent a short from occurring. Figure 1 and 2 show the normal state of the DC jack and the risk condition of exposed pins when the center barrel is damaged. The center barrel and other internal plastic components of a DC jack plays a pivotal role in ensuring safety of a PC unit during operation.



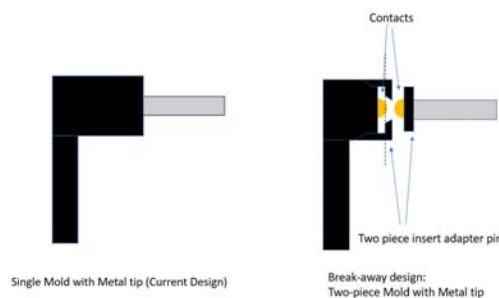
*Figure 1 – normal DC jack*



*Figure 2 – damaged DC jack*

In its current design state, any forces applied to the AC adapter plug are transferred directly to the center barrel and other internal components of the DC jack cause the adapter to act as a contributor in the potential damage of the DC jack. In a scenario where a customer is using his/her PC and charging it simultaneously, they may accidentally move the PC while still plugged in, or trip over the AC cord which will create a “yanking” force on the AC adapter plug and DC jack interconnect. In the yank motion the AC adapter applies force swiftly onto the center barrel causing the barrel or other components to break. This failure not only creates damage to the DC jack, but also leaves the jack at risk for a short event due to the power contacts being exposed.

The solution proposed is a modification to the existing AC adapter plug which would create a weaker mechanical link in the plug so that when external forces are applied, the AC plug would break away rather than transmitting those forces to the DC jack inside the PC. This break-away mechanism could be accomplished with either a reseatable mechanism or a one-time break-away which would require that the AC adapter be replaced. In either case, the solution will prevent damage to the more expensive PC and prevent a potential short-condition from occurring. Figure 3 illustrates a standard AC adapter plug design compared to the proposed break-away solution.



*Figure Standard single-mold AC plug and Proposed ‘break-away’ AC plug designs*

***Disclosed by Henry D Lewis, David A Pipho and Olumide Afolabi, HP Inc.***